

THAT WHICH IS CLAIMED IS:

1. An integrated circuit capacitor, comprising:  
an electrically insulating electrode support layer having an opening therein, on  
an integrated circuit substrate;  
a U-shaped lower electrode in the opening;  
5 a first capacitor dielectric layer extending on an inner surface and outer  
portion of the U-shaped lower electrode;  
a second capacitor dielectric layer extending between the outer portion of the  
U-shaped lower electrode and the first capacitor dielectric and also extending between  
the outer portion of the U-shaped lower electrode and an inner sidewall of the  
10 opening; and  
an upper electrode on the first capacitor dielectric layer.
2. The integrated circuit capacitor of Claim 1, wherein the second  
capacitor dielectric layer does not extend on the inner surface of the U-shaped lower  
15 electrode.
3. The integrated circuit capacitor of Claim 1, wherein the  
electrically insulating electrode support layer comprises:  
a mold layer on the integrated circuit substrate; and  
20 an etch stop layer on the mold layer.
4. The integrated circuit capacitor of Claim 3, wherein the mold layer  
comprises silicon oxide and wherein the etch stop layer comprises at least one of  
silicon nitride and/or tantalum oxide.  
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5. The integrated circuit capacitor of Claim 1, wherein the first  
capacitor dielectric layer extends onto the support layer.
6. The integrated circuit capacitor of Claim 1, wherein the first  
30 capacitor dielectric layer comprises tantalum oxide, aluminum oxide ( $\text{Al}_2\text{O}_3$ ), and/or  
Hafnium Oxide ( $\text{HfO}_2$ ).

7. The integrated circuit capacitor of Claim 1, wherein the second capacitor dielectric layer comprises a dielectric material that is not etched by an oxide etchant.

5 8. An integrated circuit capacitor, comprising:  
an electrically insulating electrode support layer having an opening therein, on  
an integrated circuit substrate;  
a U-shaped lower electrode in the opening;  
a first capacitor dielectric layer extending on an inner surface and outer  
10 portion of the U-shaped lower electrode; and  
a second capacitor dielectric layer extending between the outer portion of the  
U-shaped lower electrode and the first capacitor dielectric and also extending between  
the outer portion of the U-shaped lower electrode and an inner sidewall of the  
opening.

15 9. An integrated circuit capacitor, comprising:  
an electrically insulating electrode support layer having an opening therein, on  
an integrated circuit substrate;  
a U-shaped lower electrode in the opening, the U-shaped lower electrode  
20 having an inner surface and outer portion; and  
a capacitor dielectric layer extending on the outer portion of the U-shaped  
lower electrode and also extending between the outer portion of the U-shaped lower  
electrode and an inner sidewall of the opening.